Regulatory Requirements for Engines

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Learning Objectives

By the end of this presentation, you should:

1. Understand the rules, regulations, and permit requirements that could apply to your engine.

2. Know what information you need to collect to determine applicability.

General Terms to Know

(See the actual rules for specific definitions for each rule)

- Stationary – engines that remain or will remain on-site for at least 12 consecutive months.
- Rich Burn (RB) – low air-to-fuel ratio (fuel rich).
- Lean burn (LB)– high air-to-fuel ration (fuel lean).
- 2 Stroke (2S) - internal combustion engine in which the piston completes two separate strokes while turning the crankshaft.
- 4 Stroke (4S) –internal combustion engine in which the piston completes four separate strokes while turning the crankshaft.

Key Points to Remember

- Whether an engine is stationary or not depends on how long the engine has been **or will remain** on the site.
  - Just because it is **portable** does not mean it is not **stationary.**
- For definitions of terms, make sure you use the definition that is applicable to the regulation you are using. For example:
  - Construction under 40 Code of Federal Regulations (CFR) Part 60 “means fabrication, erection, or installation of an affected facility”.
  - Whereas construction under 40 CFR 63 “means the **on-site** fabrication, erection, or installation of an affected source.”

Overview of Rules

Here are the rules/authorizations that MAY be applicable to each type of engine.

Rule	Spark-Ignited (Natural Gas)	Compression-Ignited (Diesel)
30 Texas Administrative Code (TAC) 106.352	✓	✓ (but rare)
30 TAC 106.511/512	✓	✓
30 TAC 116.620/Non-rule Standard Permit	✓	✓
Case by Case Permit	✓	✓
30 TAC 117	✓	✓
40 CFR 63 ZZZZ	✓	✓
40 CFR 60 IIII	-	✓
40 CFR 60 JJJJ	✓	-

State Rules

30 TAC 106.352(a)-(k)

Oil & Gas Handling and Production Facilities

- Generally, will cover engines running on gas, but can authorize a dual fired engine as well.
- Engines installed at sites authorized under the historical 30 TAC 106.352(l) would fall under a separate authorization.
- Nitrogen Oxides (NOx), Carbon Monoxide (CO), and/or Volatile Organic Compounds (VOC) standards applicable for > 500 horsepower (HP).
- Emissions standards are located in Table 6 and depend on **burn, stroke, HP, and manufacture date.**

30 TAC 106.352(a)-(k)

Sampling and Demonstration of Compliance (Table 7)

- Initial testing within 180 days of start-up.
- Biennial Retesting (within 90-days of the two-year anniversary).
- For Title V sites ONLY – Portable analyzer checks semiannually (at least 90 days apart).

30 TAC 106.511

Portable and Emergency Engines & Turbines

- Engines used only for portable, emergency, and/or standby (substitute).
- Max annual operating hours shall not exceed 10% of normal annual operating schedule of primary equipment.
- No testing requirements.

30 TAC 106.512

Stationary Engines and Turbines

- Registration required if greater than 240 HP.
- NOx standards if greater than 500 HP. Depends on **burn, stroke, HP, and manufacture date**
  - Initial Testing within 60 days of start up.
  - Retest biennially (every 2 calendar years) OR every 15,000 hours of operation.
  - If using hours of operation, must have run time meter and notify of operating hours/ anticipated test date biennially.
  - Perform portable analyzer checks at least quarterly AND after engine maintenance expected to increase emissions, oxygen sensor replacement, catalyst cleaning, or catalyst replacement.

Standard Permits

30 TAC 116.620

- Complies by satisfying the requirements of 30 TAC 106.512 (other than registration).
- Cannot be claimed for new projects in Barnett Shale counties.

Non-Rule Standard Permit

- Emissions standards in Table 6 for engines > 100 HP.
- Initial testing within 180 days of start-up.
- Biennial Retesting (within 90-days of the two-year anniversary).
- For Title V sites ONLY – Portable analyzer checks quarterly (at least 30 days apart).

Case-By-Case Permits

- Most Case-By-Case permits will also have requirements for the engine.
- Generally, they will simply require compliance with the applicable state & federal rules.

30 TAC 117

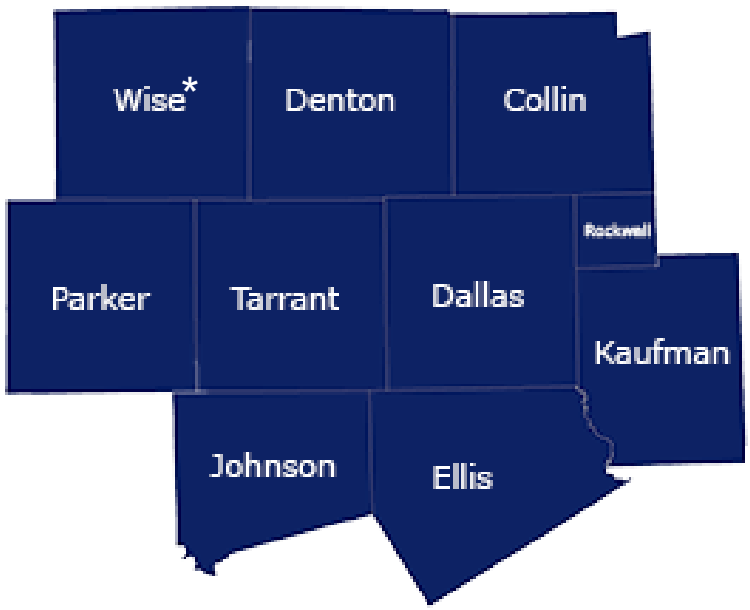
Control of Air Pollution from Nitrogen Compounds

- Engines at least 50 HP.
- Limited applicability for some engines including emergency engines and certified diesel engines operating less than 100 hours per year.
- Only applicable in certain counties.
- Limits NOx and CO.
- Standard depends on **fuel type, burn, HP, installation date, major vs. minor source of NOx.**

30 TAC 117

Historical Ozone Non-Attainment

Dallas-Fort Worth



Houston-Galveston-Brazoria

Beaumont-Port Arthur*

*Not applicable to Minor Sources of NOx

30 TAC 117

East Texas (Gas-Fired, Rich-burn Engines > 240 hp)

Anderson	Grimes	Madison	Shelby
Brazos	Harrison	Marion	Smith
Burleson	Henderson	Morris	Titus
Camp	Hill	Nacogdoches	Upshur
Cass	Hopkins	Navarro	Van Zandt
Cherokee	Hunt	Panola	Wood
Franklin	Lee	Rains	
Freestone	Leon	Robertson	
Gregg	Limestone	Rusk	

30 TAC 117

Control of Air Pollution from Nitrogen Compounds

- Initial testing within 60 days of install/becoming stationary.
- Retest biennially (every 2 calendar years) OR every 15,000 hours of operation.
- If using hours of operation, must have run time meter and notify TCEQ of total operating hours/anticipated test date biennially.
- Perform portable analyzer checks at least quarterly AND after engine maintenance expected to increase emissions, oxygen sensor replacement, or catalyst cleaning or catalyst replacement.

30 TAC 117

Definition of Stationary

- Stationary engine - “A reciprocating engine that remains or will remain at a location (**a single site at a building, structure, facility, or installation**) for more than 12 consecutive months”.
- Potentially, you can have an engine located at a particular plant for more than 12-months, but that is moving **locations** within the plant. That engine would not be considered stationary.
- Moving to a new location means moving to a **different part of the process**, not simply moving the engine a tiny bit but still having it perform the same function.

30 TAC 117

Stationary vs. Nonstationary

- There are several caveats in the definition of stationary for 30 TAC 117 that help prevent circumvention of the rule by movement of engines.
  - “An engine is considered stationary if it is removed from one location for a period and then **returned to the same location** in an attempt to circumvent the consecutive residence time requirement”
  - “Any engine (or engines) that replaces an engine at a location and that is intended to **perform the same or similar function** as the engine being replaced is included in calculating the consecutive residence time period.”

30 TAC 117

Stationary vs. Nonstationary (cont.)

Federal Rules

40 CFR 63 ZZZZ (Quad Z)

National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

- Applies to all engines at sources of hazardous air pollutants (HAPs) but requirements differ based on new vs existing.
  - Major Source: >500 hp - new if constructed/reconstructed after 12/9/02
    <500 hp - new if constructed/reconstructed after 06/12/06
  - Area Source: New if constructed/reconstructed after 06/12/06
- The following engines comply with Quad Z by complying with Quad J/Quad I:
  - Major Source: constructed/reconstructed after 12/19/02 and
    - <500 hp for compression ignited (CI), 2SLB, 4SRB, landfill/digester gas, emergency/limited use
    - <250 hp 4SLB
  - Area Source: constructed/reconstructed after 06/12/06

40 CFR 63 ZZZZ (Quad Z)

National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

- Most of the requirements are located in the tables at the end of the rule. They range from reducing CO and formaldehyde to general maintenance requirements.
- The requirements get more stringent as the engine becomes newer, larger, closer to receptors, and located at a major source.
- To determine applicability, you need to know: **construction date, HP, stroke, burn, major vs. area source of HAPs, emergency vs. non-emergency, remote area source vs. non-remote.**

40 CFR 60 IIII (Quad I)

Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

- Applies to **compression ignited** engines constructed(ordered)/reconstructed after 07/11/05 and manufactured after 04/01/06.
- Except for engines > 30 liters per cylinder of displacement, performance testing is not required – you achieve compliance by:
  - Purchasing a certified engine and
  - Installing, configuring, operating, and maintaining the engine per manufacturer's instructions
- To determine applicability, you need to know: **construction date, manufacture date, horsepower, displacement per cylinder, certification status, emergency vs. non-emergency.**

40 CFR 60 JJJJ (Quad J)

Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

- Applies to **spark-ignited** engines constructed (ordered)/reconstructed after 06/12/06 and manufactured by the following dates:
  - 07/01/07 - >500 hp (except LB < 1350 hp)
  - 01/01/08 – 500hp < LB < 1350 hp
  - 07/01/08 – < 500 hp
  - 01/01/09 – Emergency
- Establishes NOx, CO, and VOC standards.
- Initial testing (if required) within 60 days of reaching maximum production rate but no later than 180 days after initial startup.
- Schedule for subsequent testing (if any) depends on HP & manufacture date.

40 CFR 60 JJJJ

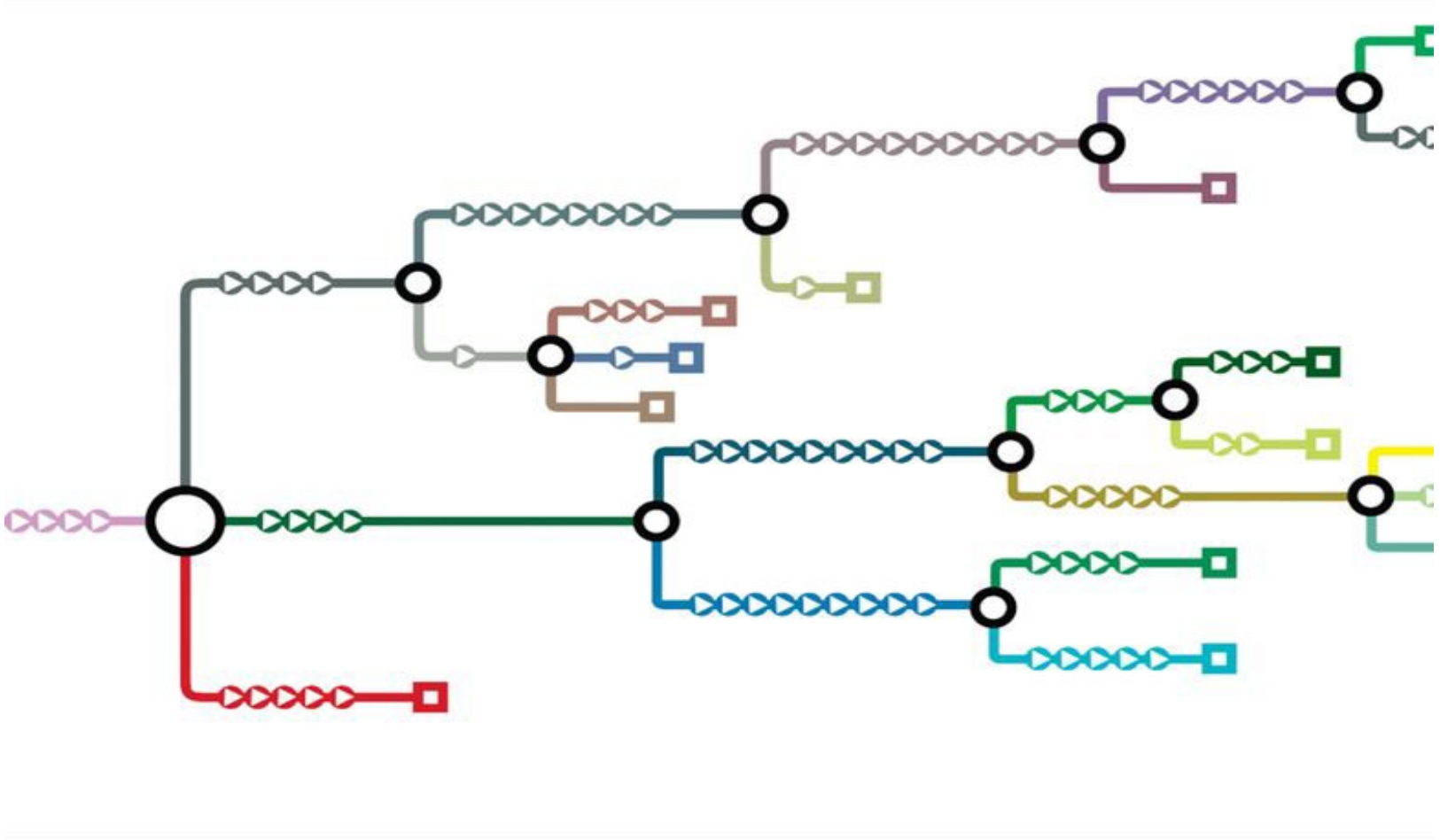
Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

- Requirements also differ based on whether the engine was certified to an emission standard by a manufacturer, and whether that engine is operated as certified.
  - Certification is required for:
    - engines <= 25hp,
    - gasoline engine > 25 hp
    - rich burn liquid petroleum gas (LPG) > 25 hp.
  - At oil and gas sites, the engines generally run-on field gas and are greater than 25 hp; therefore, they are generally non-certified engines.
- To determine applicability, you need to know: **construction date, manufacture date, stroke, burn, HP, certification status, emergency vs non-emergency.**

Federal Rule Gap Engines

- There are certain engines that comply with Quad Z simply by complying with Quad I/Quad J. Some of these engines have construction dates as early as 12/09/02.
- However, Quad I is for engines constructed after 07/11/05 and Quad J is for engines constructed after 06/12/06.
- Therefore, there exists a subset of engines that comply with Quad Z by complying with Quad I/Quad J …but have no requirements under Quad I/Quad J.
- This gap does not remove the requirements for engines under other rules (i.e. Permit Requirements or 30 TAC 117).

A now for a little adventure…



Tools for Determining Compliance

- TCEQ: Flowchart for 40 CFR 63 Subpart ZZZZ
- TCEQ: Flowchart for 40 CFR 60 IIII
- TCEQ: Flowchart for 40 CFR 60 JJJJ
- TCEQ: 30 TAC 117 Public Webpage
- EPA: Compliance Requirements for Stationary Engines

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Questions?